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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/090,969	03/06/2002	Barry Nagle	2006.PGG	7562
7590	03/23/2004			
Karen G. Kaiser NATIONAL STARCH AND CHEMICAL COMPANY 10 Finderne Avenue Bridgewater, NJ 08807-0500				
			EXAMINER FOX, DAVID T	
			ART UNIT 1638	PAPER NUMBER

DATE MAILED: 03/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/090,969	Applicant(s) NAGLE ET AL.	
	Examiner David T. Fox	Art Unit 1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1/14/04; 1/8/04; 5/28/02; 3/6/02</u> | 6) <input type="checkbox"/> Other: _____ |

Applicants' election on 07 January 2004 of the species of claim 6, namely waxy and sugary-2 as the two desired traits, is noted.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 7 and dependents are indefinite in their recitation of "planting two hybrids" in part (a), which does not correspond to the end product of maize seed. It appears that the claims are initially drawn to the planting of two hybrids of any plant species. Amendment of claims 1 and 7 to insert ---maize--- before "hybrids" in line 2 of each claim would obviate this portion of the rejection.

Claims 1, 7 and dependents are indefinite in their recitation of "planting two hybrids in blocks of rows" as it is unclear whether each block contains a mixture of the two hybrids, or whether each block contains only one of the two hybrids.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-12 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for claims limited to the planting of two maize hybrids which are homozygous recessive or dominant for kernel traits, wherein each hybrid is planted in its own block of rows, wherein said block is at least 4 rows wide, wherein said

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blocks alternate between the two types of hybrids, followed by separately harvesting seed from each type of hybrid; does not reasonably provide enablement for claims broadly drawn to the planting of two maize hybrids which are homozygous recessive or dominant for non-kernel traits such as height, disease resistance, etc, or for claims where the blocks contain mixtures of the two hybrids, followed by harvesting seed from each hybrid plant type separately. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

The claims are broadly drawn to the interplanting of maize hybrids which are homozygous recessive or dominant for any trait, including kernel traits or non-kernel traits such as plant height, disease resistance, insect resistance, etc. The claims are further drawn to the planting of the two hybrids in blocks of rows which may be mixed with both types of hybrids, or which only contain a single type of hybrid, wherein said blocks may be of any width, wherein seeds from each type of hybrid are separately harvested. In contrast, the specification only provides guidance for the separate harvesting of hybrid seed when two hybrids are planted in blocks at least four rows wide, wherein each block only contains a single type of hybrid, and wherein the hybrids are homozygous dominant or recessive for kernel traits.

It is unlikely and therefore unpredictable that the claimed method could be used for non-kernel traits. Kernel traits are immediately visible in the seed, thus facilitating separate harvesting, while seeds bearing non-kernel trait allelic differences such as leaf disease resistance or root insect resistance would be indistinguishable. Furthermore,

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the method is only adapted for the triploid nature of the endosperm which comprises the seed kernels, and the interactions of the three alleles in homozygous or heterozygous state, followed by the immediate effect of the genotype on the phenotype of the kernel. See Bergquist et al (US 5,704,160), column 7, line 32 through column 8, line 7; and Robertson et al (US 5,004,864), column 5, lines 26-41.

Furthermore, the expression of even kernel traits is unpredictable, given the interactions of the alleles within loci and across loci, as taught by Robertson et al cited above; and further in view of the decrease in pollen fitness conferred by mutant kernel trait alleles as taught by Robertson et al, column 8, lines 15-29, and the decrease in seed germination fitness conferred by mutant kernel trait alleles (see Galinat, US 4,051,629; column 1, lines 29-39).

In addition, it is unlikely and therefore unpredictable that heterogeneous blocks, or homogeneous blocks less than four rows wide, would allow sufficient pollination control and genotypic segregation to permit the separate harvesting of seed from different hybrid genotypes. See, e.g., Bergquist et al (US 5,704,160), column 2, lines 1-5; and Wych, page 599, penultimate paragraph.

Given the claim breadth, unpredictability and lack of guidance as discussed above, undue experimentation would have been required by one skilled in the art to obtain separate harvesting of seed from different maize hybrids which are planted in mixed blocks, which are planted in homogeneous blocks less than four rows wide, or which are homozygous recessive or dominant for a multitude of non-kernel traits.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pearlstein et al (US 5,675,064) in view of Bergquist et al (US 5,706,603), further in view of Nagle et al (US 5,954,883).

The claims are drawn to the crossing of two maize hybrids, one of which is male sterile and homozygous recessive for either waxy or sugary-2, and the other which is male fertile and homozygous dominant for the other kernel trait, wherein said hybrids are planted in blocks of rows, and wherein the seeds produced by said hybrids are separately harvested. The product of such a cross would be homozygous recessive for one of the kernel traits and heterozygous for the other kernel trait.

Pearlstein et al teach the desirability of starch produced by maize kernels which are homozygous recessive for the waxy allele and heterozygous for the sugary-1 allele, wherein said kernels may be produced by crossing plants which are homozygous recessive for the waxy allele and dominant for the sugary-1 allele, wherein male sterility systems are employed for controlled pollination (see, e.g., column 1, line 54 through column 2, line 35; column 2, line 51 through column 3, line 19; column 3, lines 41-46; column 4, line 61 through column 5, line 24; column 5, line 59 through column 6, line 16; column 7, line 36 through column 8, line 39; column 9, lines 35-62; column 11, lines 17-26; column 12, lines 3-10 and 61-67; column 13, lines 1-10).

Pearlstein et al do not teach the use of planting blocks of rows, the separate harvest of seed from each parental hybrid, or the use of the sugary-2 allele.

Bergquist et al teach the advantages of crossing blocks of maize plants including maize hybrids which differ in kernel quality trait alleles such as waxy, wherein separate harvest from different hybrid parents may be employed, and wherein male sterility systems are employed to control pollination (see, e.g., column 1, lines 13-21; column 3, line 25 through column 4, line 16; column 6, lines 9-27; column 8, line 48 through column 9, line 12; column 10, lines 7-12 and Table 1; column 11, lines 1-27 and 60-67; columns 12-13; column 18, line 61 through column 19, line 26; column 21, lines 13-18 and 30-56; claims 1, 19-20 and 22).

Nagle et al teach the desirability of maize kernels which are homozygous for waxy and heterozygous for sugary-2, wherein said kernels may be produced by crossing maize plants which are homozygous for waxy with maize plants which are

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dominant for Sugary-2, wherein male sterility systems may be employed (see, e.g., column 3, line 62 through column 4, line 59).

It would have been obvious to one of ordinary skill in the art to utilize the method of crossing two maize plants which have different alleles at the waxy and sugary loci using male sterility, as taught by Pearlstein et al, and to modify that method by incorporating hybrid plants and separate harvesting, as taught by Bergquist et al, and to further modify that method by incorporating the Sugary-2 locus for the production of improved starch as taught by Nagle et al; given the recognition by those of ordinary skill in the art that each would have continued to function in its known and expected manner, and given the suggestion by Bergquist et al of the wide applicability of the method. Choice of block width greater than 4 rows would have been the optimization of process parameters.

No claim is allowed.

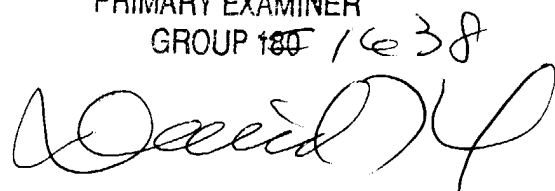
Any inquiry concerning this communication or earlier communications from the examiner should be directed to David T. Fox whose telephone number is (571) 272-0795. The examiner can normally be reached on Monday through Friday from 10:30AM to 7:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amy Nelson, can be reached on (571) 272-0804. The fax phone number for this Group is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-1600.

March 21, 2004

DAVID T. FOX
PRIMARY EXAMINER
GROUP 1638

A handwritten signature in black ink, appearing to read "David T. Fox", is written over the printed name and title.